CLAIMS:

1. A method of noise whitening a received signal, the method comprising the steps of:

estimating the noise of a channel;

calculating the power spectrum of the channel;

adding the estimated noise and the calculated power spectrum to build a positive definite band matrix;

applying symmetric factorisation to the matrix;

deriving the spectral factorisation of the channel from the symmetric factorisation;

approximating the spectral factorisation;

calculating the noise whitening prefilter settings from the approximated spectral factorisation and the estimated noise of the channel; and

prefiltering the received signal to noise whiten the signal.

2. A method according to claim 1, wherein the step of calculating the noise whitening prefilter settings comprises direct polynomial division of the approximated spectral factorisation and the estimated noise of the channel.

3. A method according to claim 1 or 2, wherein the power

spectrum is calculated by autocorrelation.

4. A method according to any one of claims 1 to 3, wherein the symmetric factorisation is square-root-less Cholesky factorisation.

5. A method according to any one of claims 1 to 4, wherein the spectral factorisation is approximated by reversing the non-zero elements of the last row of the decomposed lower triangle of the matrix.

6. A method according to claim any one of claims 1 to 5, wherein the band symmetric factorisation comprises a Toeplitz matrix.

7. A method for setting a prefilter of an equalizer comprising calculating the noise whitening prefilter settings according the method of any one of claims 1 to 6.

8. A prefilter for an equalizer having noise whitening settings derived by the steps of:

estimating the noise of a channel;

calculating the power spectrum of the channel;

adding the estimated noise and the calculated power spectrum to build a positive definite band matrix;

applying symmetric factorisation to the matrix;

deriving the spectral factorisation of the channel from the symmetric factorisation;

approximating the spectral factorisation; and

calculating the noise whitening prefilter settings from the approximated spectral factorisation and the estimated noise of the channel.

9. An equalizer for a demodulator of a wireless communication system comprising a prefilter according to claim 8.

10. A device for demodulating a signal transmitted via a channel comprising:

a channel estimator for generating a channel estimate for said channel;

prefilter setting means for deriving noise whitening settings for a prefilter by the method according to any one of claims 1 to 6;

a prefilter, set according to the settings derived by the prefilter setting means, for noise whitening said signal; and

a sequence estimator for estimating any distortion caused during transmission of said noise whitened signal.